1/23 (A) (B) (C) (D) (E) (F)

Figure 1 (A-F)

Construct Forms Comprising at Least one Single-Stranded Region

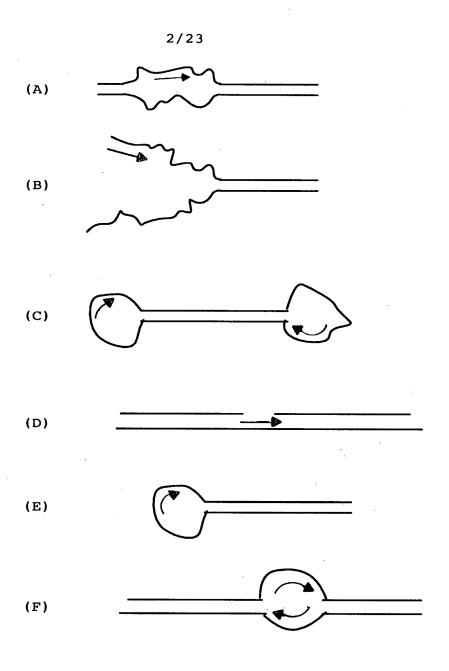


Figure 2 (A-F)

Functional Forms of the Construct

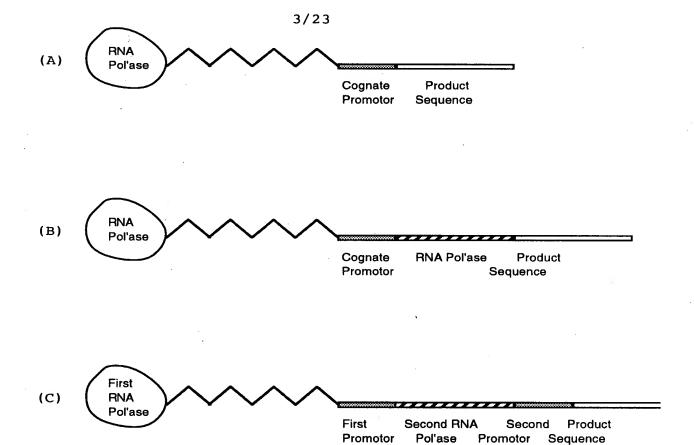


Figure 3 (A-C)

Three Constructs with an RNA Polymerase Covalently Attached to a Transcribing Cassette

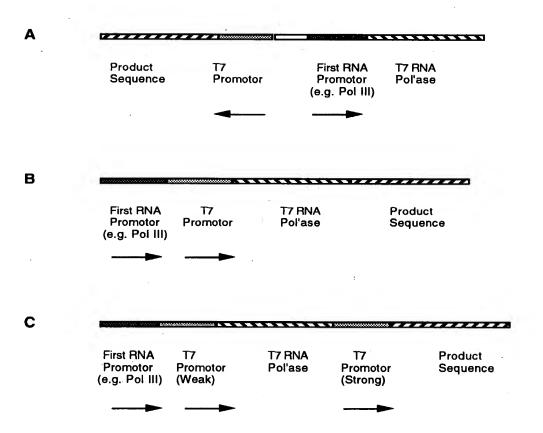


Figure 4 (A-C)

Three Constructs with Promoters for Endogenous RNA Polymerase

M13mp18. \$	Seq	Length:	7250
-------------	-----	---------	------

1.	AATGCTACTA	CTATTAGTAG	AATTGATGCC	ACCITITICAG	стоесс
51.	AAATGAAAAT	ATAGCTAAAC	AGGTTATTGA	CCATTTGCGA	AATGTATCTA
101.	ATGGTCAAAC	TAAATCTACT	CCTTCCCAGA	ATTGGGAATC	AACTGTTACA
151.	TGGAATGAAA	CTTCCAGACA	COGTACTITA	GTTGCATATT	TAMACATGT
201	TGAGCTACAG	CACCAGATTC	AGCAATTAAG	CTCTAAGCCA	TOOGCAAAAA
251	TGACCTCTTA	TCAAAAGGAG	CAATTAAAGG	TACTCTCTAA	TOCTGACCTG
301.	TTGGAGTTTG	CTTCCCGCTCT	GGTTCGCTTT	GAAGCTOGAA	TTAAAACGCG
351.	ATATTTGAAG	TCTTTCGGGC	TTCCTCTTAA	TCTTTTGAT	CCAATCCCCT
401.	TTGCTTCTGA	CTATAATAGT	CAGGGTAAAG	ACCTGATTIT	TGATTTATGG
451.	TCATTCTCGT	TTTCTGAACT	GTTTAAAGCA	TTTGAGGGGG	ATTCAATGAA
501.	TATTTATGAC	GATTOCGCAG	TATTOGACGC	TATCCAGTCT	AAACATTTTA
551.	CTATTACCCC	CTCTGGCAAA	ACTICITITIE	CAAAAGCCTC	TOGCTATTTT
601.	GGTTTTTATC	GICGICICGI	AAAOGAGGGT	TATGATAGTG	TTGCTCTTAC
651.	TATECCTCGT	AATTCCTTTT	GGCGTTATGT	ATCTGCATTA	GITGAATGTG
701.	GTATTCCTAA	ATCTCAACTG	ATGAATCTTT	CTACCTGTAA	TAATGTTGTT
751.	COGTTAGTTC	GTTTTATTAA	CGTAGATTTT	TCTTCCCAAC	GTOCTGACTG
801.	GTATAATGAG	CCAGTTCTTA	AAATOGCATA	AGGTAATTCA	CAATGATTAA
851.	AGTTGAAATT	AAACCATCTC	AAGCCCAATT	TACTACTOGT	TCTGGTGTTC
901.	TOGTCAGGGC	AAGCTTATT	CACTGAATGA	GCAGCTTTGT	TACGTTGATT
951.	TGGGTAATGA	ATATCCGGTT	CTTGTCGAAG	ATTACTCTTG	ATGAAGGTCA
1001	GOCAGOCTAT	GOGOCTEGTC	TGTACACCGT	TCATCTGTCC	TCTTTCAAAG
1051	TIGGTCAGTT	COGTICCCTT	ATGATTGACC	GTCTGCGCCT	OGTTOOGGCT
1101	AAGTAACATG	GAGCAGGTOG	CGGATTTCGA	CACAATTTAT	CAGGOGATGA
1151	TACAAATCTC	CGTTGTACCTT	таттововс	TTGGTATAAT	COCTOCOCC
1201	CAAAGATGAG	TGTTTTAGTG	TATTCTTTCG	CCTCTTTCGT	TTTAGGTTGG

Figure 5

			•		
1251	TGCCTTCGTA	GTGGCATTAC	GTATTTTACC	CGTTTAATCG	AAACTTCCTC
1301	ATGAAAAAGT	CTTTAGTCCT	CAVAGCCTCT	GTAGCOGTTG	CTACCCTCGT
1351	TOOGATGCTG	TCTTTCGCTG	CTGAGGGTGA	OGATOCCCCA	AAAGOGGOCT
1401	TTAACTCCCT	GCAAGCCTCA	GOGACOGAAT	ATATOGGTTA	TGOGTGGGGG
1451	ATGGTTGTTG	TCATTGTCGG	COCAACTATC	GGTATCAAGC	TGTTTAAGAA
1501	ATTCACCTCG	AAAGCAAGCT	GATAAACCGA	TACAATTAAA	GCTCCTTTT
1551	GGAGCCTTTT	TTTTTGGAGA	TTTTCAACGT	GAAAAAATTA	TTATTCGCAA
1601	TTCCTTTAGT	таттосттто	TATTCTCACT	COCCTICANAC	TGTTGAAAGT
1651	TGTTTAGCAA	AACCCCATAC	AGAAAATTCA	TTTACTAACG	TCTGGAAAGA
1701	CGACAAAACT	TTAGATCGTT	ACGCTAACTA	TGAGGGTTGT	CTGTGGAATG
1751	CTACAGGCGT	TGTAGTTTGT	ACTEGTGACG	AAACTCAGTG	TTACGGTACA
1801	TGGGTTCCTA	ттесесттес	TATCCCTGAA	AATGAGGGTG	GTGGCTCTGA
1851	GGGTGGCGGT	TCTGAGGGTG	GOOGTTICTICA	GEGTGECCEGT	ACTAAACCTC
1901	CTGAGTACGG	TGATACACCT	ATTCCGGGCT	ATACTTATAT	CAACCCTCTC
1951	GACGGCACTT	ATCCCCCTCCC	TACTGAGCAA	AACCOGCTA	ATOCTAATOC
2001	TTCTCTTGAG	GAGTCTCAGC	CTCTTAATAC	TTTCATGTTT	CAGAATAATA
2051	GGTTCCGAAA	TAGGCAGGGG	GCATTAACTG	TTTATACGGC	CACTGTTACT
2101	CAAGGCACTG	ACCCCGTTAA	AACTTATTAC	CAGTACACTC	CTGTATCATC
2151	AAAAGCCATG	TATGACGCTT	ACTOGAACOGG	TAAATTCAGA	GACTGCGCTT
2201	CAAGGCACTG	ACCCCGTTAA	AACTTATTAC	CAGTACACTC	CTGTATCATC
2151	AAAAGCCATG	TGCCTCAACC	TCCTGTCAAT	ectegogge	ecticiestes
2201	TOCATTCTGG	CTTTAATCAA	GATOCATTOG	TTTGTGAATA	TCAAGGCCAA
2251	TOGTCTGACC	TGCCTCAACC	TOCTGTCAAT	ecteececc	ecticiestes
2301	TEGTTCTEGT	GEOGRACICIG	AGGGTGGTGG	CTCTGAGGGT	GEOOGITICIG
2351	AGGGTGGCCG	CTCTGAGGGA	GCCCCCTTCCCC	GTGGTGGCTC	TEGTTCCGGT
2401	GATTTTGATT	ATGAAAAGAT	GGCAAACGCT	AATAAGGGGG	CTATGACCGA
2451	AAATGCCGAT.	GAAAAACGCCGC	TACAGTCTGA	COCTAMAGGC	AAACTTGATT

Figure 5

2501	CTGTCGCTAC	TGATTACGGT	CCTCCTATCG	ATGGTTTCAT	TGGTGACGTT
2551	TOOGGOOTTG	CTAATGGTAA	TGGTGCTACT	GGTGATTTTG	CTGGCTCTAA
2601	TTCCCAAATG	GCTCAAGTOG	GTGACGGTGA	TAATTCACCT	TTAATGAATA
2651	ATTTCCGTCA	ATATTTACCT	TOCCTOCCTC	AATCGGTTGA	ATGTCGCCCT
2701	TTTGTCTTTA	COCCTCCTAA	ACCATATGAA	TTTCTATTG	ATTGTGACAA
2751	AATAAACTTA	TTCCGTCGTG	TCTTTGCGTT	TCTTTTATAT	GTTGCCACCT
2801	TTATGTATGT	ATTTTCTACG	TTTGCTAACA	TACTGCGTAA	TAAGGAGTCT
2851	TTATCATGCC	AGTTCTTTTG	GGTATTCCGT	TATTATTGCG	TTTOCTOGGT
2901	ПССПСТСВ	TAACTTTGTT	COGCTATCTG	CTTACTTTTC	TTAMAAGGG
2951	CTTCGGTAAG	ATAGCTATTG	CTATTTCATT	вттствет	CTTATTATTG
3001	GGCTTAACTC	AATTCTTGTG	GGTTATCTCT	CTGATATTAG	CCCTCAATTA
3051	COCTCTGACT	TTGTTCAGGG	TGTTCAGTTA	ATTCTCCCGT	CTAATGCGCT
3101	TCCCTGTTTT	TATGTTATTC	TCTCTGTAAA	GCTCCTATT	TTCATTTTTG
3151	ACGTTAAACA	AAAAATCGTT	TCTTATTTGG	ATTGGGATAA	ATAATATGGC
3201	TGTTTATTTT	GTAACTGGCA	AATTAGGCTC	TGGAAAGACG	CTCGTTAGCG
3251	TTGGTAAGAT	TCAGGATAAA	ATTIGITAGCTG	GGTGCAAAAT	AGCAACTAAT
3301	CTTGATTTAA	GGCTTCAAAA	CCTCCCCCAA	GTCCGCGACGT	TOGCTAAAAC
3351	GCCTCGCGTT	CTTAGAATAC	CGGATAAGCC	TTCTATATCT	GATTTGCTTG
3401	CTATTGGGCG	COGTAATGAT	TOCTACGAATG	AAAATAAAA	сееспесп
3451	GTTCTCGATG	AGTGCGGTAC	TTGGTTTAAT	ACCOGTTCTT	GGAATGATAA
3501	GGAAAGACAG	COGATTATTG	ATTGGTTTCT	ACTGCTCGT	AAATTAGGAT
3551	GGGATATTAT	тттспат	CAGGACTTAT	CTATTGTTGA	TAAACAGGCG
3601	COTTCTGCAT	TAGCTGAACA	TGTTGTTTAT	TGTOGTOGTC	TGGACAGAAT
3651	TACTTTACCT	TTTGTCGGTA	CTTTATATTC	TCTTATTACT	GGCTCGAAAA
3701	TECCTCTECC	TAAATTACAT	спосость	TTAAATATGG	CGATTCTCAA
3751	TTAAGCCCTA	CTGTTGAGCG	TTGGCTTTAT	ACTGGTAAGA	ATTTGTATAA
3801	OGCATATGAT	ACTANACAGG	CTTTTTCTAG	TAATTATGAT	TOOGGTGTTT

Figure 5

3851	ATTCTTATTT	AACGCCTTAT	TTATCACACG	GTOGGTATTT	CAAACCATTA
3901	AATTTAGGTC	AGAAGATGAA	ATTAACTAAA	ATAATATTGA	AAAAGTTTTC
3951	TOGOGITICIT	TGTCTTGCGA	TTGGATTTGC	ATCAGCATTT	ACATATAGTT
4001	ATATAACCCA	ACCTAAGCCG	GAGGITAAAA	AGGTAGTCTC	TCAGACCTAT
4051	GATTTTGATA	AATTCACTAT	TGACTCTTCT	CAGOGTCTTA	ATCTAAGCTA
4101	TOGCTATGTT	TTCAAGGATT	CTAAGGGAAA	ATTAATTAAT	AGOGAOGATT
4151	TACAGAAGCA	AGGTTATTCA	CTCACATATA	TTGATTTATG	TACTGTTTCC
4201	ATTAMAMAG	GTAATTCAAA	TGAAATTGTT	AAATGTAATT	AATTTGTTT
4251	TCTTGATGTT	TGTTTCATCA	тсттстттв	CTCAGGTAAT	TGAAATGAAT
4301	AATTOGOCTC	TGCGCGATTT	TGTAACTTGG	TATTCAAAGC	AATCAGGCGA
4351	AATCCGTTATT	GTTCTCCCCG	ATGTAAAAGG	TACTGTTACT	GTATATTCAT
4401	CTGACGTTAA	ACCTGAAAAT	CTACGCAATT	TCTTTATTTC	TGTTTTACGT
4451	GCTAATAATT	TTGATAATGGT	TGGTTCAATT	OCTTOCATAA	TTCAGAAGTA
4501	TAATCCAAAC	AATCAGGATT	ATATTGATGA	ATTGCCATCA	TCTGATAATC
4551	AGGAATATGA	TGATAATTCC	COUNTING	GIGGITICIT	TGTTCCGCAA
4601	AATGATAATG	TTACTCAAAC	TTTAAAATT	AATAACGTTC	GGGCAAAGGA
4651	TTTAATACGA	GTTGTCGAAT	TGTTTGTAAA	GTCTAATACT	TCTAAATCCT
4701	CAAATGTATT	ATCTATTGAC	GGCTCTAATC	TATTAGTTGT	TAGTGCTCCT
4751	AAAGATATTT	TAGATAACCT	TOCTCAATTC	CTTTCTACTG	TTGATTTGCC
4801	AACTGACCAG	ATATTGATTG	AGGGTTTGAT	ATTTGAGGTT	CAGCAAGGTG
4851	ATGCTTTAGA	TTTTCATTT	GCTGCTGGCT	CTCAGOGTGG	CACTGTTGCA
4901	GGCGGTGTTA.	ATACTGACCG	OCTCAOCTCT	GTTTTATCTT	CTECTEGIEG
4951	ПОСПОССТ	ATTTTTAATG	GOGATGTTTT	AGGGCTATCA	GTTCGCCGCAT
5001	TAAAGACTAA	TAGOCATTCA	AAAATATTGT	CTGTGCCACG	TATTCTTACG
5051	CTTTCAGGTC	AGAAGGGTTC	TATCTCTGTT	GGCCAGAATG	TOCCTTTTAT
5101	TAAAGACTAA	TAGOCATTCA	AAAATATTGT	CTGTGCCACG	TATTCTTACG
5151	CGATTGAGCG	TCAAAATGTA	GGTATTTCCA	TGAGCGTTTT	TOCTGTTGCA

Figure 5

5201	ATGGCTGGCG	GTAATATTGT	TCTGGATATT	ACCAGCAAGG	COGATAGTTT
5251	GAGTTCTCT	ACTCAGGCAA	GTGATGTTAT	TACTAATCAA	AGAAGTATTG
5301	CTACAACGGT	TAATTTGCGT	GATGGACAGA	CTCTTTTACT	COGTICOCCTIC
5351	ACTGATTATA	AAAACACTTC.	TCAAGATTCT	GGCGTACCGT	TOCTGTCTAA
5401	AATCCCTTTA	ATOGGOCTOC	TGTTTAGCTC	COCCTCTGAT	TOCAAOGAGG
5451	AAAGCACGTT	ATACGTGCTC	GTCAAAGCAA	CCATAGTACG	COCCTGTAG
5501	CCCCCCATTA	AGOGGGGGG	GIGIGGIGGI	TACGCGCAGC	GTGACCGCTA
5551	CACTTGCCAG	COCCTAGCG	COOCCTCCTT	тесттет	∞
5601	CTCGCCACGT	TOGOOGGCTT	TOCCOGTICAA	GCTCTAAATC	GGGGGCTCCC
5651	TITAGGGTTC	CGATTTAGTG	CTTTACGGCA	CCTCGACCCC	AAAAACTTG
5701	ATTTGGGTGA	TGGTTCACGT	AGTGGGCCAT	OGCCCTGATA	GACGGTTTTT
5751	COCCTTTGA	COTTOCACTO	CACGITCITT	AATAGTGGAC	TCTTGTTCCA
5801	AACTGGAACA	ACACTCAACC	CTATCTCGGG	CTATTCTTTT	GATTTATAAG
5851	GCATTTTGCC	GATTTOGGAA	CCACCATCAA	ACAGGATTTT	COCCTOCTOC
5901	GGCAMACCAG	OGTGGACCGC	TTGCTGCAAC	TCTCTCAGGG	CCAGGOOGTG
5951	AAGGGCAATC	AGCTGTTGCC	CGICTOCCIG	GTGAAAAGAA	AAACCACCCT
6001	GGCGCCCAAT	ACGCAMACCG	CCTCTCCCCCG	CCCCTTCCCC	GATTCATTAA
6051	TOCACCTOCC	ACGACAGGTT	TOOOGACTOG	AMGCGGGCA	GTGAGCGCAA
6101	CGCAATTAAT	GTGAGTTAGC	TCACTCATTA	GGCACCCCAG	GCTTTACACT
6151	TTATGCTTCC	GGCTCGTATG	TIGIGIGGAA	TTGTGAGCGG	ATAACAATTT
6201	CACACAGGAA	ACAGCTATGA	CCATGATTAC	GAATTOGAGC	TOGGTACCCG
6251	GOGATOCTCT	AGAGTOGACC	TOCAGOCATO	CAAGCTTGGC	ACTGGCCGTC
6301	GTTTTACAAC	GTOGTGACTG	GGAAAACCCT	GGCGTTACCC	AACTTAATCG
6351	CCTTGCAGCA	CAATCCCTT	TOGOCAGCTG	GOGTAATAGC	GAAGAGGCCCC
6401	GCACCGATCG	CCCTTCCCAA	CAGTTGCGCA	GOCTGAATGG	CGAATGGCGC
6451	тпесстест	TTCCCGCCACC	AGAAGCGGTG	CCCGAMAGCT	COCTOCACTO
6501	CGATCTTCCT	GAGGCCGATA	व्यवाव्याव्या	CCCTCAAAC	TEGECAGATEC

Figure 5

6551	ACCITTACCIA	TGCGCCCATC	TACACCAACG	TAACCTATCC	CATTACGGTC
6601	AATCCCCCCGT	TTGTTCCCAC	GCACAATCCG	ACGCGTTGTT	ACTOGCTCAC
6651	ATTTAATGTT	GATGAAAGCT	GGCTACAGGA	AGGCCAGACG	CGAATTATTT
6701	TTGATGGCGT	TCCTATTGGT	TAAAAAATGA	GCTGATTTAA	CAAAAATTTA
6751	ACGCGAATTT	TAACAAAATA	TTAACGTTTA	CAATTTAAAT	ATTTGCTTAT
6801	ACAATCTTCC	TGTTTTGGG	GCTTTTCTGA	TTATCAACCG	GGGTACATAT
6851	GATTGACATG	CTAGTTTTAC	GATTACCGTT	CATCGATTCT	спідтіяст
6901	CCAGACTCTC	AGGCAATGAC	CTGATAGCCT	TTGTAGATCT	CTCAAAAATA
6951	GCTACCCTCT	COCCATGAA	TTTATCAGCT	AGAACGGTTG	AATATCATAT
7001	TGATGGTGAT	TTGACTGTCT		TCACCCTTTT	GAATCTTTAC
7051	CTACACATTA	CTCAGGCATT	GCATTTAAAA	TATATGAGGG	TTCTAAAAAT
7101	TTTTATCCTT	GOGTTGAAAT	AAAGGCTTCT	OCCGCAAAAG	TATTACAGGG
7151	TCATAATGTT	TTTGGTACAA	COGATTTAGC	TTTATGCTCT	GAGGCTTTAT

Figure 5

COMPLEMENTARY TO M₁₃

POSITION 645	5 ' * 3' AGCAACACTATCATA	POSITION 631	M ₁₃ /1
615	ACGACGATAAAAACC	601	M ₁₃ /2
585	TTTTGCAAAAGAAGT	571	M ₁₃ /3
555	AATAGTAAAATGTTT * *	541	M ₁₃ /4
525	CAATACTGCGGAATG	511	M ₁₃ /5
495	TGAATCCCCTCAAA	481	M ₁₃ /6
465	AGAAAACGAGAATGA	451	M ₁₃ /7
435	CAGGTCTTTACCCTG	421	M ₁₃ /8
405	AGGAAAGCGGATTGC	391	M ₁₃ /9
375	AGGAAGOCCGAAAGA	361	M ₁₃ /10

COMPLEMENTARY TO SS PHAGE DNA

POSITION	5' * * 3'	POSITION	
351	ATATTTGAAGTCTTT	366	M ₁₃ /11
371	TCTTTTTGATGCAAT	386	M ₁₃ /12
391	CTATAATACTCAGGG	406	M ₁₃ /13
411	TGATTTATGGTCATT	426	M ₁₃ /14
431	GTTTAAAGCATTTGA	446	M ₁₃ /15
451	TATTTATGACGATTC	466	M ₁₃ /16
471	TATOCAGTCTAAACA	486	M ₁₃ /17
491	CTCTGGCAAAACTTC	506	M ₁₃ /18
511	TCGCTATTTTGGTTT	526	M ₁₃ /19
531	AAACGAGGGTTATGA	546	M _{13/2} 0

Figure 6

Primers for Nucleic Acid Production Derived from M13mp18 Sequence

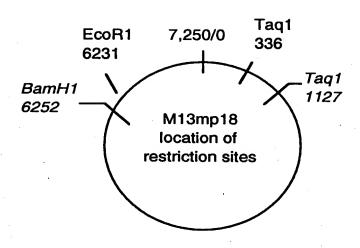
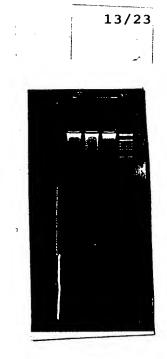


Figure 7

Appropriate M13mp18 Restriction Sites



Lane 1: from calf thymus + Taq digested mp18 amplification reaction

Lane 2: from Taq digested mp18 amplification reaction

Lane 3: from calf thymus amplification reaction

Lane 4: øX174 Hinf1 size marker

Figure 8



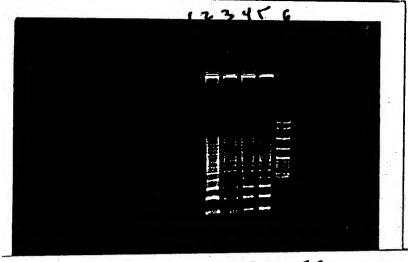
Lane 1: no template

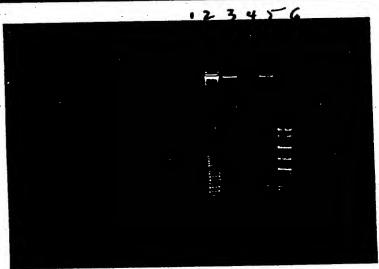
Lane 2: mp18 template, phosphate buffer

Lane 3: Mspl/pBR322 size marker

Lane 4: mp18 template, MOPS buffer

Figure 9





Top= (+) Template Bottom= (-) Template

Lane 1: phosphate buffer

Lane 2: MES
Lane 3: MOPS
Lane 4: DMAB
Lane 5: DMG

Lane 6: pBR322/Mspl size marker

Figure 10



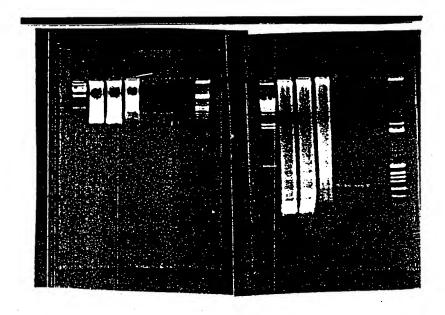
Lane 1: DMAB buffer, no template Lane 2: DMAB buffer, mp18 template Lane 3: DMG buffer, no template

Lane 4: DMG buffer, mp18 template

Lane 5: No reaction

Lane 6: 200 ng Taq I digested mp18 size marker/positive control

Figure 11



First Time Interval Second Time Interval

Agarose Gel Analysis

Lane 1: lambda Hind III marker

Lane 2: Amp/Untreated

Lane 3: Amp/Kinased

Lane 4: Amp/Kinased/Ligated

Lane 5: PCR/Untreated

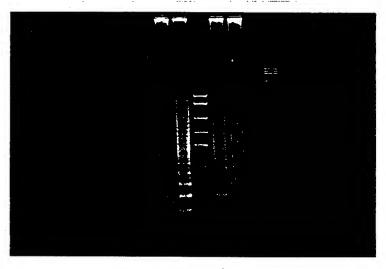
Lane 6: PCR/Kinased

Lane 7: PCR/Kinased/Ligated

Lane 8: øX174/Hinf1 marker

Figure 13

1 2 3 4 5 6



Lane 1: Primers alone

Lane 2: Primers + taq digested M13 DNA

Lane 3: Molecular weight markers

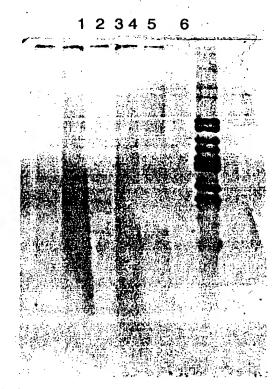
Lane 4: Primers + RNA

Lane 5: Primers alone

Lane 6: M13 digested DNA

Buffer was dimethyl amino glycine, pH 8.6

Figure 14



Lane 1: Primers alone

Lane 2: Primers + taq digested M13 DNA

Lane 3: Molecular weight markers

Lane 4: Primers + RNA

Lane 5: Primers alone

Lane 6: M13 digested DNA

Buffer was dimethyl amino glycine, pH 8.6

Figure 15

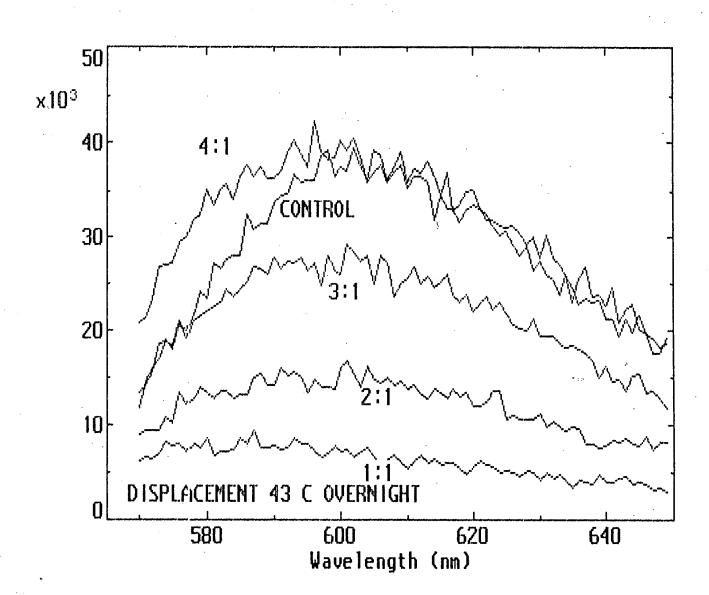


Figure 16



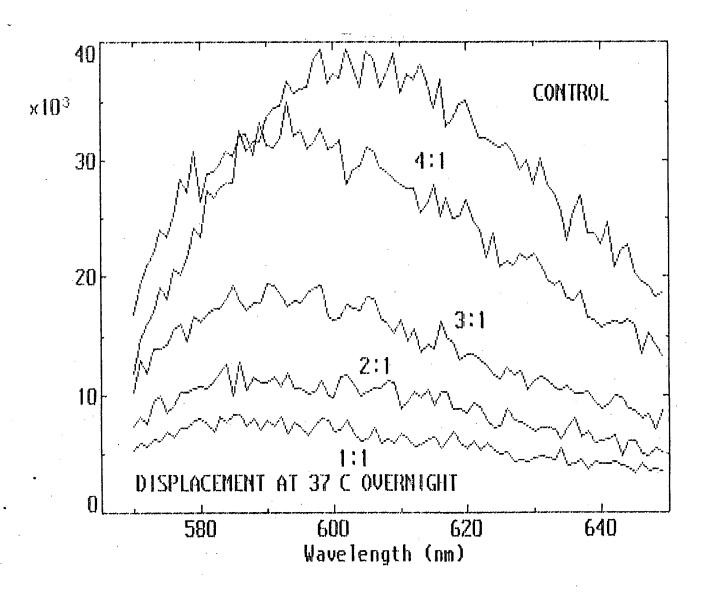


Figure 17

pIBI 31-BH5-2

fmet AUG of Lac z

LAC PROMOTOR ATG ACC ATG ATT ACG CCA GAT ATC AAA TTA ATA CGA CTC ACT ATA

oligo 50-mer

3'- tac t*aa t*gc ggt* ct*a t*ag t*Vt aat* tat* gct* gag t*ga t*at* c-5' 10 base insert

T7 RNA Start {«« T3 Promotor Region } IGGG CTC ICCT TTA GTG ACG GTT AAT ...»»} «- T3 Start Signal

pIBI 31 BSII/HCV

fmet AUG of Lac z {T3 Promotor region -»} T3 RNA Start LAC PROMOTOR .ATG ACC ATG ATT ACG CCA AGC TCG AAA TTA ACC CTC ACT AAA /GGG oligo 50-mer 3'- tac t*aa t*ac t*aa t*gc ggt* t*V--10 base insert--.....

{«- T7 Promotor Region }

MULTIPLE CLONING SITE + 390 BASE INSERT CTA /TAG TGA GTC CGT ATT AAT....

«- T7 Start Signal

5'-ct*a t*ag t*ga gt*c gt*a tt*a at*...........